

ABSTRACT OF THE DISCLOSURE

A Czochralski single crystal pulling apparatus having a one or more flow nozzles used to reduce or eliminate unwanted orbital motion during crystal growth. A portion of the purge gas supplied to the crystal puller is diverted to the flow nozzles, which direct purge gas flow on the growing crystal in a direction that counteracts the orbital force. Mass flow controllers and/or valves are actuated by a controller such that flow is only directed by any flow nozzle when the crystal is in a perigree interval relative to that nozzle, with the proper amount of purge gas directed such that orbit can be significantly reduced or eliminated.